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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,865	09/30/2003	Toshiyuki Miyabayashi	U 014833-7	1874

7590 02/13/2006

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,865

Applicant(s)

MIYABAYASHI

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/19/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claim 15 is objected to because of the following informalities:

In line 3 after “carbon”, it is advised that “lack” is changed to “black”.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites “-RSO₂”: R represents a C₁-C₁₂ alkyl group or a phenyl group and a modified group thereof”. The scope of the claim is confusing because it is not clear what is meant by “modified” or what types of compounds the phrase “modified group thereof” encompasses. Further, the scope of the claim is confusing because it is not clear what R must be. Due to the use of the word “and” after “phenyl”, it appears that R is either alkyl group or phenyl group and modified group thereof. Must R be both phenyl group and modified group thereof or is R alkyl group or phenyl group or modified phenyl group? Clarification is requested.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (U.S. 5,415,964) in view of either Nakamura et al. (U.S. 2003/0195274) or Mishina et al. (U.S. 6,511,534)

Hayashi et al. disclose pigment coated with polymer, i.e. microencapsulated pigment, wherein the pigment is organic pigment or carbon black and the polymer is obtained from hydrophilic monomer including cationic monomer such as 2-hydroxy-3-methacryloyloxypropyltrimethylammonium salt or dimethylaminoethyl methacrylate and anionic monomer such as (meth)acrylic acid, hydrophobic monomer, and crosslinkable monomer. It is disclosed that combinations of hydrophilic monomers are utilized. The pigment coated with polymer is prepared by polymerization of the monomers in aqueous dispersion of the pigment in

the presence of surfactant and initiator (col.1, lines 63-68, col.2, lines 12-20, 25-34, and 40-46, col.3, lines 1-8, col.4, line 18, col.4, line 56-col.5, line 10, col.5, lines 27-37 and 39, and col.7, lines 45-64).

The difference between Hayashi et al. and the present claimed invention is the requirement in the claims of pigment having anionic group on its surface.

Nakamura et al. disclose microencapsulated pigment wherein the pigment is surface treated with hydrophilic group imparting agents that include sulfonic acid group, sulfinic acid group, and carboxyl group. The motivation for using such pigment is to prevent pigment from agglomerating during microencapsulation (paragraphs 16, 123, 132, 141, and 146-147).

Alternatively, Mishina et al. disclose microencapsulated self-dispersing pigment wherein the self-dispersing pigment comprises functional group on its surface which is hydrophilic group such as anionic group including carboxyl group and sulfonic acid group. The motivation for using such self-dispersing pigment is to produce pigment which exhibits excellent water-dispersibility without the use of dispersant (col.6, lines 2-6 and 56-64).

In light of the motivation for using microencapsulated pigment wherein the pigment has anionic groups on its surface disclosed by Nakamura et al. or Mishina et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the polymer coated pigment of Hayashi et al. in order to produce polymer coated pigment wherein the pigment will not agglomerate during production or, alternatively, which exhibits excellent water-dispersibility, and thereby arrive at the claimed invention.

6. Claims 1-8, 10-17, 21-22, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 2001/96483 in view of either Nakamura et al. (U.S. 2003/0195274) or Mishina et al. (U.S. 6,511,534).

WO 2001/96483¹ discloses ink jet ink comprising water, glycerin, 0.3-30% solid wetting agent such as saccharide, at least one of 1,2-alkylene glycol or glycol ether, and pigment enveloped in polymer, i.e. microencapsulated pigment, wherein the pigment is organic pigment or carbon black and the polymer is a copolymer of cationic polymerizable group-having dispersant, crosslinking monomer, and copolymerizable monomers that include hydrophilic monomer with anionic group such as (meth)acrylic acid and hydrophobic monomer. The cationic polymerizable group-having dispersant has a polymerizable group such as vinyl, allyl, or (meth)acryloyl, hydrophobic group, and hydrophilic group that is cationic group such as quaternary ammonium. There is also disclosed process for making the microencapsulated pigment comprising dispersing pigment in water with polymerizable group-having dispersant, adding copolymerizable monomer and initiator, and polymerizing (paragraphs 1, 16, 93, 127, 128, 132, 139-140, 149, 160, 162, 167, 173, 193, 205, 211, 274, and claim 56). Given that WO 2001/96483 disclose ink containing microencapsulated pigment obtained from same process and components as presently claimed, it is clear that such ink would intrinsically possess same amount of unreacted monomer as presently claimed after formation of the microencapsulated pigment.

¹ It is noted that when utilizing WO 2001/96483, the disclosures of the reference are based on Yatake et al. (U.S. 2003/0106462) which is an English language equivalent of the reference. Therefore, the column and line numbers cited with respect to WO 2001/96483 are found in Yatake et al.

The difference between WO 2001/96483 and the present claimed invention is the requirement in the claims of (a) pigment having anionic group on its surface and (b) process for making the microencapsulated pigment.

With respect to difference (a), Nakamura et al., which is drawn to ink jet inks, disclose microencapsulated pigment wherein the pigment is surface treated with hydrophilic group imparting agents that include sulfonic acid group, sulfinic acid group, and carboxyl group. The motivation for using such pigment is to prevent pigment from agglomerating during microencapsulation in order to produce ink with excellent dispersion stability and ejection stability that is capable of forming images with high density (paragraphs 16, 123, 132, 141, and 146-147).

Alternatively, Mishina et al., which is drawn to ink jet inks, disclose microencapsulated self-dispersing pigment wherein the self-dispersing pigment comprises functional group on its surface which is hydrophilic group such as anionic group including carboxyl group and sulfonic acid group. The motivation for using such self-dispersing pigment is to produce pigment which exhibits excellent water-dispersibility without the use of dispersant (col.6, lines 2-6 and 56-64).

In light of the motivation for using microencapsulated pigment wherein the pigment has anionic groups on its surface disclosed by Nakamura et al. or Mishina et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the microencapsulated pigment of WO 2001/96483 in order to produce microencapsulated pigment wherein the pigment will not agglomerate during production which produces ink with excellent dispersion stability and ejection stability that is capable of forming images with high density or,

alternatively, to produce microencapsulated pigment which exhibits excellent water-dispersibility, and thereby arrive at the claimed invention.

With respect to difference (b), WO 2001/96483 discloses process for producing microencapsulated pigment comprising adding cationic polymerizable group-having dispersant to aqueous dispersion of pigment particles followed by mixing and treatment by irradiation with ultrasonic waves followed by adding monomer including hydrophobic monomer, anionic monomer, and crosslinking monomer and initiator to carry out emulsion polymerization.

There is no disclosure of adding cationic polymerizable group-having dispersant followed by adding hydrophobic monomer and crosslinkable monomer (claim 14) followed by adding anionic monomer and then adding initiator and no disclosure of mixing and treatment by irradiation with ultrasonic wave after adding the anionic monomer as required in present claims 13 and 14.

However, given that the method of WO 2001/96483 encompasses adding monomer and initiator in any order including that presently claimed, it therefore would have been obvious to one of ordinary skill in the art, absent evidence to the contrary, to add cationic polymerizable group-having dispersant then hydrophobic monomer and crosslinkable monomer (claim 14) then anionic monomer and then initiator in the process of WO 2001/96483.

Further, paragraph 172 of WO 2001/96483 discloses that for dispersing the pigment, ultrasonic waves are utilized. Therefore, it therefore would have been obvious to one of ordinary skill in the art to utilize ultrasonic waves anytime during the process for producing the microencapsulated pigment of WO 2001/96483 including after addition of both the cationic

polymerizable group-having dispersant and the anionic monomer in order to prevent the pigment particles from agglomerating.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to produce microencapsulated particles of WO 2001/96483 by adding cationic polymerizable group-having dispersant first followed by hydrophobic monomer and crosslinkable monomer followed by adding anionic monomer and then initiator and utilizing ultrasonic waves after addition of both the cationic polymerizable group-having dispersant and the anionic monomer in order to prevent agglomeration of the pigment particles during the process, and thereby arrive at the claimed invention.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 2001/96483 in view of either Nakamura et al. or Mishina et al. as applied to claims 1-8, 10-17, 21-22, and 26-31 above, and further in view of Miyabayashi (U.S. 6,602,333) and JP 10-046073.

The difference between WO 2001/96483 in view of either Nakamura et al. or Mishina et al. and the present claimed invention is the requirement in the claims of the amount of unreacted monomer present after a purification treatment of the ink.

Miyabayashi discloses purifying ink in order to remove unreacted monomer.

Pending formal translation and using a machine translation of the reference, it is noted that JP 10-046073 discloses using ink having less than 1000 ppm unreacted monomer in order to produce ink with no odor that has good print quality (paragraphs 39-40).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to purify the ink of WO 200/96483 in order that the ink have 1000 ppm or less unreacted

monomer in order to produce ink with no odor that has good print quality, and thereby arrive at the claimed invention.

8. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 2001/96483 in view of either Nakamura et al. or Mishina et al. as applied to claims 1-8, 10-17, 21-22, and 26-31 above, and further in view of Miyabayashi et al. (U.S. 6,271,285).

The difference between WO 2001/96483 in view of either Nakamura et al. or Mishina et al. and the present claimed invention is the requirement in the claims of anionic fine particles.

Miyabayashi et al., which is drawn to ink jet ink, disclose the use of anionic fine particles having carboxyl groups on the surface wherein the anionic fine particles have glass transition temperature less than 30 °C, particle diameter of 5-200 nm, and reactivity with divalent metal salt such that when three volumes of 0.1% by weight of aqueous emulsion of the particle of the polymer is brought into contact with one volume of aqueous divalent metal salt having concentration of 1 mol/L, the time for transmission of light at wavelength of 700 nm to be decreased to 50% of the initial transmission is not more than 1×10^4 seconds. The motivation for using such anionic fine particles is to produce ink with excellent storage stability (col.3, line 20-col.4, line 43).

In light of the motivation for using anionic fine articles disclosed by Miyabayashi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such anionic fine particles in the ink of WO 200/96483 in order to produce ink with excellent storage stability, and thereby arrive at the claimed invention.

9. Claims 1-2, 4-9, 11, 15-17, 22, 26, and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by Vincent et al. (U.S. 2004/0157956) in view of either Nakamura et al. (U.S. 2003/0195274) or Mishina et al. (U.S. 6,511,534).

Vincent et al. disclose ink jet ink comprising water, glycol ether, and latex encapsulated pigment wherein the pigment includes carbon black and the latex is obtained from charge forming monomer, i.e. anionic monomer, such as (meth)acrylic acid, crosslinking monomer, and reactive surfactant having phobic segment such as alkyl with reactive group and hydrophilic segment including cationic group such as quaternary ammonium. It is disclosed that the latex encapsulated pigment is prepared by adding pigment to monomers in water containing surfactant. It is further disclosed that the pigment is self-dispersing pigment having chemical group attached to the surface (paragraphs 1, 13, 15, 25, 28, 43, 48, 50, 55, 56, 63, and 64).

The difference between Vincent et al. and the present claimed invention is the requirement in the claims of pigment having anionic group on its surface.

While Vincent et al. disclose that that the pigment is self-dispersing pigment having chemical group attached to the surface, there is no disclosure that these chemical groups are anionic.

Nakamura et al., which is drawn to ink jet inks, disclose microencapsulated pigment wherein the pigment is surface treated with hydrophilic group imparting agents that include sulfonic acid group, sulfinic acid group, and carboxyl group. The motivation for using such pigment is to prevent pigment from agglomerating during microencapsulation in order to produce ink with excellent dispersion stability and ejection stability that is capable of forming images with high density (paragraphs 16, 123, 132, 141, and 146-147).

Alternatively, Mishina et al., which is drawn to ink jet inks, disclose microencapsulated self-dispersing pigment wherein the self-dispersing pigment comprises functional group on its surface which is hydrophilic group such as anionic group including carboxyl group and sulfonic acid group. The motivation for using such self-dispersing pigment is to produce pigment which exhibits excellent water-dispersibility without the use of dispersant (col.6, lines 2-6 and 56-64).

In light of the motivation for using microencapsulated pigment wherein the pigment has anionic group groups on its surface disclosed by Nakamura et al. or Mishina et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the microencapsulated pigment of Vincent et al. in order to produce microencapsulated pigment wherein the pigment will not agglomerate during production which produces ink with excellent dispersion stability and ejection stability that is capable of forming images with high density or, alternatively, to produce microencapsulated pigment which exhibits excellent water-dispersibility, and thereby arrive at the claimed invention.

10. Claims 27-28 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent et al. in view of either Nakamura et al. or Mishina et al. as applied to claims 1-2, 4-9, 11, 15-17, 22, 26, and 29 above, and further in view of WO 2001/96483.

The difference between Vincent et al. in view of either Nakamura et al. or Mishina et al. and the present claimed invention is the requirement in the claims of solid wetting agent and glycerin.

WO 2001/96483, which is drawn to ink jet ink, discloses the use of combination of 0.5-30% solid wetting agent, i.e. saccharide, and glycerin in order to prevent ink from clogging printer nozzles and to ensure long-term ejection stability (paragraph 128).

In light of the motivation for using combination of saccharide and glycerin disclosed by WO 2001/96483 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such combination in the ink of Vincent et al. in order to produce ink that does not clog printer nozzles and has long-term stability, and thereby arrive at the claimed invention.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

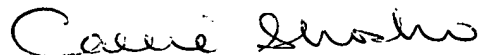
Kato (U.S. 6,866,707) discloses ink jet ink comprising microencapsulated pigment wherein the pigment is encapsulated by polymer obtained from cationic polymerizable surfactant and anionic monomer, however, there is no disclosure that the pigment has anionic groups on its surface as presently claimed.

Miyabayashi (U.S. 6,864,302) discloses microencapsulated pigment wherein the pigment is encapsulated by polymerizable cationic surfactant and anionic monomer, however, there is no disclosure that the pigment has anionic groups on its surface as presently claimed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho
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Art Unit 1714

CS
2/6/06